

**CALIBRATION WORKING GROUP
ACTION ITEMS AND RECOMMENDATIONS**

Philip N. Slater

**MODIS Science Team Meeting
1 October 1993**

1. Request that GSFC/SBRC review and briefly respond to the various issues raised in the hand-outs from Paul Menzel and Zhengming Wan. In particular the following are concerns in the IR:

Preflight characterization of stray background radiation as a function of view angle when viewing the blackbody, space, and an earth target, e.g., lowering the earth target to the temperature of LN₂. Can this be monitored in flight?

Preflight and in-flight characterization of the non-linear response of all the thermal channels. These should be reported as a function of the temperature measurements of the imaging optics, the on-board blackbody, etc.

Bill Barnes/Dick Weber

Response by Nov 1, 1993

2. Bob Evans has expressed concern regarding the in-flight stability of the radiance of the on-board blackbody. What information is available on the changes of emissivity with time on orbit? Is there any provision for monitoring the blackbody radiant output on orbit? Request GSFC/SBRC review and briefly respond.

Bill Barnes/Dick Weber

Response by November 1, 1993

3. Recommend an L_{\max} value be agreed to for bands 31 and 32. Barton, Kaufman, Menzel, and Wan suggest 340 - 350 K, whereas Justice wants it to remain at 400K. Note that calibration is more accurate at the lower temperature.

Bill Barnes

Response by November 1, 1993

4. Determine the need for careful in-flight characterization of thermal cycling effects on MODIS performance. For example, can preflight T/V tests, which are static and measured on plateaus, provide the necessary information with confidence? Are gradients important? The data required are, e.g., changes with temperature of sensor sensitivity and registration for all channels.

Bill Barnes/Dick Weber

Response by February 1, 1994

5. Recommend that a study be made of the possibility of acquiring monthly nadir views of the moon. The justification is that all the Eos optical sensors would benefit from these opportunities for calibration purposes. See Hugh Kieffer's view graph.

Guenther/Westmeyer/MMC

Response by February 1, 1994

6. Recommend that Kieffer's funding for characterizing lunar spectral radiance be continued. This work is of general applicability to many Eos sensors, as well as important Eos-related sensors such as SeaWiFS. Importantly, SeaWiFS can be used to validate the lunar calibration method for MODIS, but Kieffer's work must be continued now. Determine the level of interest of the calibration scientists of the other sensors and how the necessary funding can be obtained.

Guenther

Response by November 1, 1993

Lunar Calibration

H. Kieffer

ADVANTAGES:

- Sun is the source, so color temperature is correct and Fraunhofer lines are included
- Spectrally bland diffuser, stability of $\sim 10^8$ years - beyond meddling
- No extra optics or gadgets. NONE.
- "Pre-launch" calibration has no impact on instrument schedule
- Can be used by many instruments; the ultimate cross-calibration
- Could be cost-shared over many systems
- Very extended black and cold background: ~ 0 scattered light

DISADVANTAGES:

- Lunar brightness varies periodically; must be determined
- Radiance levels are a fraction of L_{\max} (better for oceans?)
- Attitude requirements: spacecraft and management

7. There is considerable interest in including contamination monitors on the AM-1 platform. This is both to determine the initiation, frequency and duration of solar-diffuser and scan-mirror door deployment, and also to help diagnose the degradation and change in calibration of the various optical sensors.

Guenther/Westmeyer/Slater

Response by February 1, 1994

8. Recommend that QCMs should be added preflight to all MODIS models for test purposes and to monitor contamination during I&T.

Bill Barnes/Weber

Response by November 1, 1993

9. The preflight calibration of SeaWiFS using a solar-radiation-based method offers two major system-level advantages over conventional methods. First, it provides the only method to conduct an end-to-end, solar-diffuser-and-sensor preflight calibration. Second, it is a reliable method (since it uses the same stable source - the sun) to track changes, in the preflight SI-based calibration (using an integrating-sphere source), introduced during I&T, launch, etc. Bill Barnes is trying to have the solar-radiation-based preflight calibration implemented for MODIS.

Bill Barnes/Weber

Response by February 1, 1994

10. Recommend that the system-level specification be rewritten for the out-of-band response of some filters that presently have a 5% requirement. The latter is inconsistent with the radiometric calibration uncertainty specification.

Bill Barnes/Weber

Response by November 1, 1993

11. The present round-robin cross-calibration activities for SeaWiFS will conclude this year. Recommend that the Eos Cal/Val program expand the cross-calibration activities between radiometric laboratories to include field validation instruments, sources and reference panels for both land, atmosphere and ocean investigations.

Guenther

Response by November 1, 1993

12. The ATBD review has been postponed pending receipt of the instrument calibration algorithms from SBRC.

A Calibration Plan review will be held in the second quarter of CY'94. Those MST members who have contributed to the Cal Plan document will be asked to present their material for review. All MST members will be invited to attend.

Slater/Guenther/Barker

Response by February 1, 1994